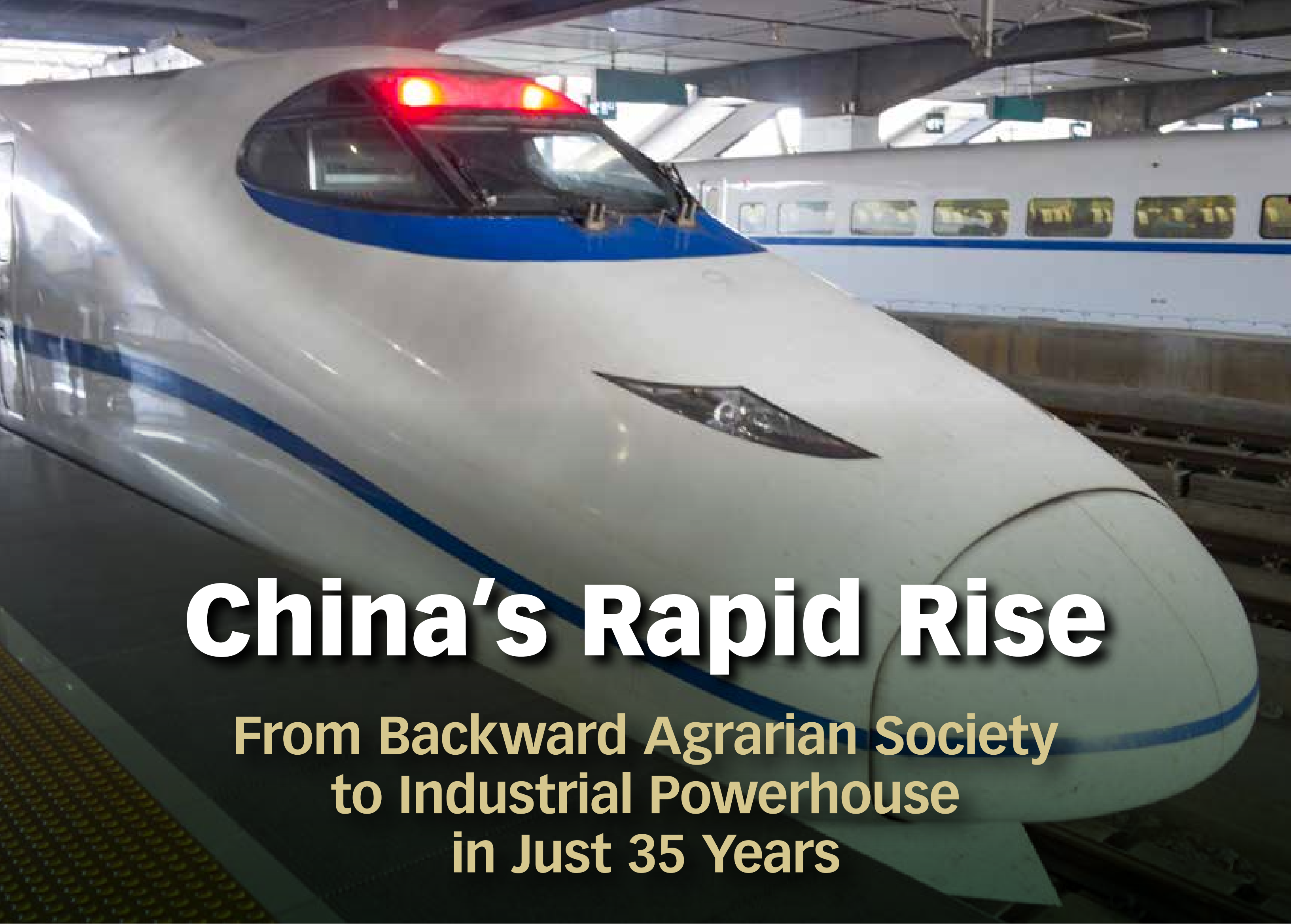


China's Rapid Rise

From Backward Agrarian Society to Industrial Powerhouse in Just 35 Years

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By Yi Wen

China's industrial revolution, which started 35 years ago, is perhaps one of the most important economic and geopolitical phenomena since the original Industrial Revolution 250 years ago. The reason is simple: Less than 10 percent of the world's population is fully industrialized; if China can successfully finish its industrialization, an *additional* 20 percent of the world's population will be entering modern times. Along the way, China is igniting new growth across Asia, Latin America, Africa and even the industrial West, thanks to the country's colossal demand for raw materials, energy, trade and capital flows.

China's rapid growth has puzzled many people, including economists.

How could a nation with 1.4 billion people transform itself relatively suddenly from a vastly impoverished agricultural land into a formidable industrial powerhouse when so many tiny nations have been unable to do so despite their more favorable social-economic conditions? Among the many conflicting views that have emerged to interpret China's rise, two stand out as the most popular and provocative. The first sees China's hypergrowth as a gigantic government-engineered bubble. It is not sustainable and will collapse because China has no democracy, no human rights, no freedom of speech, no rule of law, no Western-style legal system, no well-functioning markets, no private banking sector, no protection of intellectual properties, no ability to innovate (other than copying and stealing Western technologies and business secrets), nor a host of many other things that the West has possessed for centuries and have proved essential for Western prosperity and technological dominance.[1] According to this view, the bubble will burst at the expense of China's people and environment.

The second view sees China's dramatic rise simply as destiny. It is returning to its historical position: China had been one of the richest nations and greatest civilizations (alongside India) from at least 200 B.C. to 1800, the dawn of the Industrial Revolution in England. (See Figure 1.) It was only a matter of time for China to reclaim its historical glory and dominate the world once again. (As Napoleon once said, "Let China sleep, for when the dragon awakes, she will shake the world." [2])

But neither view is backed by serious economic analysis, instead being based either on prejudice or naïve extrapolation of human history. How could a nation with all those adverse elements for business and innovation be able to grow at a double-digit annual rate for several decades and transform itself in such a short time from an impoverished agricultural economy into a formidable manufacturing powerhouse? If culture or ancient civilization is the explanation, then why aren't Egyptian, Greek or Ottoman empires bursting onto the world stage?

This article provides a different view of China's rise, one based on fundamental economic analysis. It hopefully will lead to a better understanding of China's miracle growth but also will shed light on the failures and successes of many other nations' attempts at industrialization, including the original Industrial Revolution itself.

Admittedly, many people think China's economic miracle has come to an end. The growth of its economy has declined sharply from the double digits to 7 percent or lower. Its stock market is in turmoil, and its currency is under attack. But keep in mind that the United States experienced 15 financial crises and a four-year civil war as it rose to global prominence. It was on the verge of collapse in 1907 after taking on the mantle of the world's superpower from the United Kingdom. The U.S. also weathered the Great Depression in the 1930s and the global financial crisis in 2007. Does all of this mean it is no longer an economic star?

Some Facts about China's Rise

Thirty-five years ago, China's per capita income was only one-third of that of sub-Sahara Africa. Today, China is the world's largest manufacturing powerhouse: It produces nearly 50 percent of the world's major industrial goods, including crude steel (800 percent of the U.S. level and 50 percent of global supply), cement (60 percent of the world's production), coal (50 percent of the world's production), vehicles (more than 25 percent of global supply) and industrial patent applications (about 150 percent of the U.S. level). China is also the world's largest producer of ships, high-speed trains, robots, tunnels, bridges, highways, chemical fibers, machine tools, computers, cellphones, etc.

Figure 2 shows the manufacturing output of the top five countries in the world between 1970 and 2013. In the early 1970s, when President Richard Nixon visited China, it produced very few manufactured goods—a tiny fraction of the U.S. level. About 1980, China's manufacturing started to take off, surpassing the industrial powers one by one, overtaking the U.S. in 2010 to become the No. 1 industrial powerhouse.

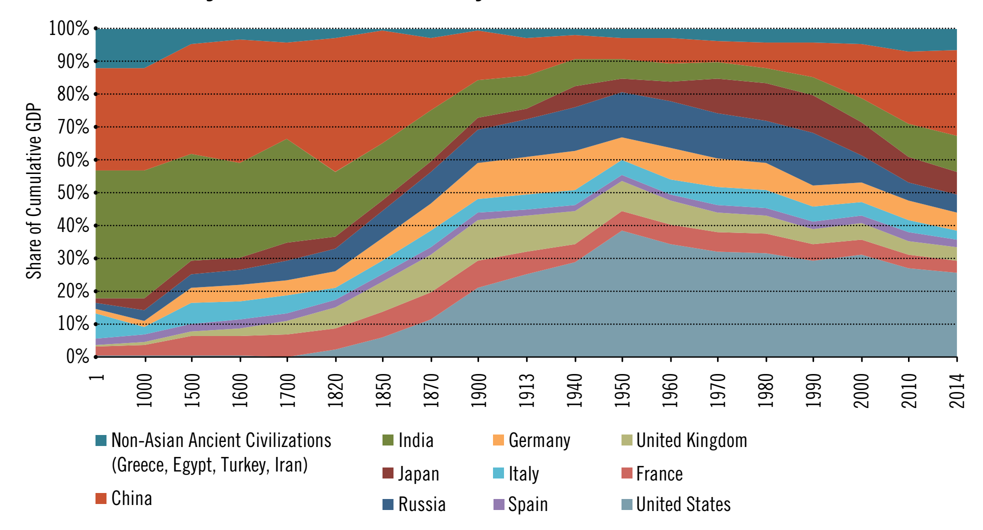
"The Secret Recipe"

How did China achieve this in 35 years? The short answer is that China has rediscovered the "secret recipe" of the Industrial

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FIGURE 1

Economic History of China and Other Major Powers



SOURCE: The Maddison-Project, http://www.ggdc.net/maddison/maddison-project/home.htm, 2013 version.
NOTE: The cumulative gross domestic product is for all the countries listed and represents at least 70 percent of the total for the world at any given time, with the rest provided by smaller countries.

Revolution. But what is the secret recipe, and why didn't China find it sooner?

The British Industrial Revolution was one of the most important socioeconomic events in human history—perhaps as significant as the discovery of fire and agriculture. Before this revolution, humanity across all continents had lived essentially at a subsistence level, stagnating in the so-called Malthusian trap.[3] But the Industrial Revolution changed it all: Starting about 1760, the living standard in the United Kingdom began to increase dramatically, leading to an era of permanent growth in per capita income. Because of the almost magical increases in living standards and national income, among other things, almost every nation has tried to emulate the British Industrial Revolution.

Unfortunately, only a few places have succeeded: Northern and Western Europe, the United States, Japan and the Asian Tigers, among others. Although the Asian Tigers (South Korea, Taiwan, Hong Kong and Singapore) industrialized rather quickly after WWII, some of them (such as Taiwan) so far have reached a per capita income of only about half the U.S. level.

Why have only a few nations succeeded? Political institutions are the key, according to the institutional theory. Inclusive institutions (e.g., democracy) put restrictions on the elite class, allowing the free market, free trade, private property rights and the rule of law to flourish. This implies private incentives for wealth accumulation, innovation and growth. On the other hand, extractive institutions (such as dictatorship) imply the lack of not only freedom of choice but of protection of private-property rights and the rule of law, all of which leads to the lack of private incentives to work hard, accumulate capital and innovate. The end result is poverty. Therefore, the solution for ending poverty is simple: democracy.[4]

Or is it?

Such theories are difficult to square with the facts. First, there are ample democracies with pervasive economic stagnation and continuous political turmoil: Afghanistan, Egypt, Iraq, Libya, Pakistan, Thailand, Tunisia and Ukraine, to name a few. Second, there are ample extractive institutions that have been economically strong, such as Germany (1850-WWII) and Russia (1860-WWII). The institutional theory also can't explain the dismal failure of today's Russia at economic reform under democracy and shock therapy, Japan's rapid industrialization during the Meiji Restoration, South Korea's economic takeoff in the 1960s-1980s under dictatorship or Singapore's post-independence economic miracle. Nor can the theory explain why under identical political institutions, property rights and the rule of law, there exist pockets of both extreme poverty and extreme wealth, as well as of violent crime and obedience to law. Such dichotomies exist in many U.S. cities, for example. Italy is another example, with its poverty in the south and wealth in the north.

China's Past Failures

What is happening in China is not its first attempt at industrialization but the fourth over the past 120 years.

The first attempt was made between 1861 and 1911. It came on the heels of China's defeat in 1860 by the British in the Second Opium War. Deeply humiliated by unequal treaties imposed by Western industrial powers, the Qing monarchy that was then in control in China embarked on a series of ambitious programs to modernize its backward agrarian economy, including establishing a modern navy and industrial system. This attempt started eight years earlier than the Meiji Restoration that triggered Japan's successful industrialization. Fifty years later, the effort in

China turned out to be a gigantic failure: The government was deep in debt, and the hoped-for industrial base was nowhere in sight.

A nationwide demand for political reforms, followed by social turmoil, ultimately led to the 1911 Xinhai Revolution. It overthrew the "extractive" Qing monarchy and established the Republic of China, the first "inclusive" government in China based on Western-style constitutions. The new republic tried to industrialize China by a wholesale mimicking of U.S. political institutions, including democracy and the separation of powers (legislative, executive and judicial branches of government).

At that time, a famous slogan among the Chinese was "Only science and democracy can save China." The revolutionaries of the educated elite believed that the monarchy's failure to industrialize and China's overall backwardness were due to its lack of democracy, political inclusiveness and pluralism (exactly as the modern institutionalism theory has argued). But 40 years passed, and China remained one of the poorest nations on earth.

In 1949, the republic was defeated by the Communist peasant army. The new government initiated the third ambitious attempt to industrialize China—this time by mimicking the Soviet Union's central planning model. Thirty years passed, and the effort failed again: In 1978, China remained essentially in the same Malthusian poverty trap, with per capita income not significantly different from what it was around the Second Opium War.

Hence, the reason for China's three failures was clearly not the lack of free market and private-property rights—the Qing dynasty had probably a better market system and better private-property rights than did England and the rest of Europe in the 17th and 18th centuries. Nor was it the lack of democracy—the government of the Republic of China was so inclusive that even members of the Communist Party were allowed in the government.

What Was Different This Time?

China's fourth attempt started in 1978 under leader Deng Xiaoping. The country refused to take advice from Western economists (unlike what Russia did in the 1990s) and instead took a very humble, gradualist, experimental approach with its economic reforms. The keys to this approach have been to:

1. maintain political stability at all costs;
2. focus on the grassroots, bottom-up reforms (starting in agriculture instead of in the financial sector);
3. promote rural industries despite their primitive technologies;
4. use manufactured goods (instead of only natural resources) to exchange for machinery;
5. provide enormous government support for infrastructure buildup;
6. follow a dual-track system of government/private ownership instead of wholesale privatization; and
7. move up the industrial ladder, from light to heavy industries, from labor- to capital-intensive production, from manufacturing to financial capitalism, and from a high-saving state to a consumeristic welfare state.

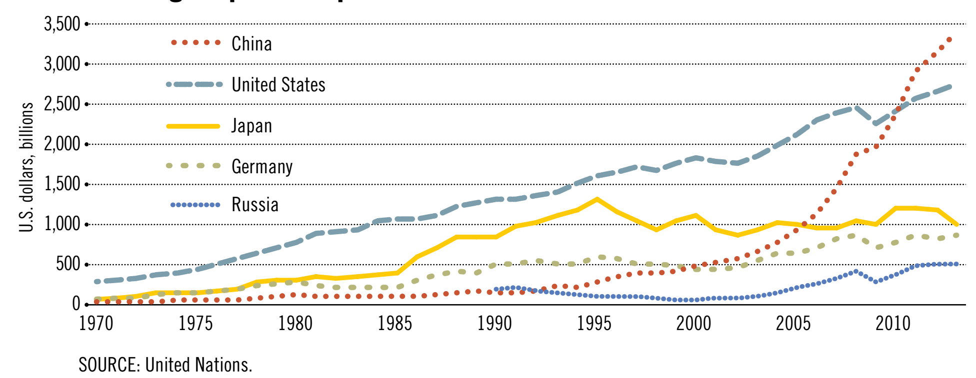
China's fourth attempt mimics the historical sequence of the British Industrial Revolution, despite dramatic differences in political institutions. (After all, China is still an authoritarian state.) The British Industrial Revolution followed five key stages:

1. the proto-industrialization stage, which developed rural industries for long-distance trade;
2. the first industrial revolution, which featured labor-intensive mass production for the mass market;
3. the industrial trinity boom, which involved the mass supply of energy, locomotive power and infrastructure to facilitate mass distribution;[5]

FIGURE 2



Manufacturing Output for Top Five Countries in 2013



SOURCE: United Nations.

4. the second industrial revolution, featuring the mass production of the means of mass production, such as steel and machine tools (including agricultural machinery), as well as the creation of a large credit system; and
5. the welfare state stage, which incorporates economic welfare (such as the modern service economy, unemployment insurance, equal access to health care and education, and a full-fledged social safety net) and political welfare (such as democracy, human rights, the end of the death penalty, legalization of gay marriage).

Along such a development path, democracy is the consequence instead of the cause of industrialization. Democracy reinforces stability only in industrialized societies. Almost all successfully industrialized economies have gone through these key stages in history, as the following examples show:

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U.K. path to industrialization:[6]

1. 1600-1760: Proto-industrialization in rural areas, organized and financed by rich merchants (e.g., via the putting-out system[7]);
2. 1760-1830: first industrial revolution in textile industries, relying on wood-framed and water-powered textile machines for mass production;
3. 1830-1850: boom in industrial trinity: energy (such as coal), transportation (such as railroad) and locomotive (such as steam engine);
4. 1850-1900: second industrial revolution, involving the mass production of the means of mass production, such as iron, steel, chemicals and machinery; and
5. After 1900: entering the welfare state (e.g., universal suffrage in 1928).

U.S. path to industrialization:

1. Before 1820: rural industries mushrooming in the countryside;
2. 1820-1860: first industrial revolution—mass production of textiles, based on imported or stolen British technologies;
3. 1830-1870: boom in industrial trinity, such as the 1828-1873 railroad mania;
4. 1870-1940: second industrial revolution, featuring mass production of steel, automobiles, telecommunications, chemicals and mechanized agriculture in the 1940s; and
5. 1940s-present: entering the welfare state after WWII with such key steps as the civil rights movement in the 1960s, universal suffrage in 1965, Violence Against Women Act of 1994 and legalization of same-sex marriage in 2015.

Japan's path to industrialization:

1. 1603-1868 (the Edo period): commercial agriculture and rural artisan manufacturing flourished amid political stability;
2. 1868-1890 (early Meiji): full-fledged proto-industrialization;
3. 1890-1920 (including late Meiji): first industrial revolution, based on mass production of textiles, relying on imported machinery and exports of labor-intensive textile products;
4. 1900-1930: boom in industrial trinity (e.g., railroads);
5. 1920-1941: beginning of second industrial revolution; and
6. 1945-1980: continuation of second industrial revolution, democratic reform under U.S. occupation, entering welfare state.

China's Path

China compressed the several centuries of Western (and Japanese) development into three decades. Its path to industrialization has gone through three major phases:

1. 1978-1988: proto-industrialization. This phase featured the sprouting of millions of rural enterprises (collectively instead of privately owned by farmers) across China's vast countryside and small towns; these enterprises acted as the engine of national economic growth during the first 10 years of economic reform. The number of village firms increased more than 12-fold (from 1.5 million to 18.9 million), village industrial gross output increased more than 13.5-fold (from 14 percent of gross domestic product, or GDP, to 46 percent of GDP), village peasant-workers grew to nearly 100 million by 1988, and farmers' aggregate wage income increased 12-fold. Because of such phenomenal growth in the supply of basic consumer goods, China ended its shortage economy (a typical feature of all centrally planned economies, characterized by the rationing of meat, other food,

clothes and other basic consumer goods) in the mid-1980s and simultaneously solved its food security problem. The 800 million farmers were the biggest beneficiaries of the economic reform in this period.

2. 1988-1998: first industrial revolution. This phase featured mass production of labor-intensive light consumer goods across China's rural and urban areas, relying first mainly on imported machinery. During this period, China became the world's largest producer and exporter of textiles, the largest producer and importer of cotton, and the largest producer and exporter of furniture and toys. Rural enterprises continued their hypergrowth, and their workers reached 30 percent of China's entire rural labor force (not including migrant workers). Village industrial output grew by 28 percent per year, doubling every three years (an astronomical 66-fold increase) between 1978 and 2000.
3. 1998-present: second industrial revolution. This phase featured the mass production of the means of mass production. Because of the rapidly and enormously expanding domestic market for intermediate goods, machinery and transportation, there was a big surge in the consumption and production of coal, steel, cement, chemical fibers, machine tools, highways, bridges, tunnels, ships, etc. In all, 2.6 million miles of public roads were built, including more than 70,000 miles of express highways (46 percent more than in the U.S.). Twenty-eight provinces (out of 30) have high-speed trains (with total length exceeding 10,000 miles, 50 percent more than the total for the rest of the world).

The Triumph of Marketism?

Is China's achievement the triumph of marketism? Yes and no. "Yes" for obvious reasons: Markets impose economic incentives to compete, impose discipline on management and on technology adoption, and create Darwinian "creative destruction" to eliminate losers.

But "no" for overlooked reasons: It's extremely costly for independent, anarchic, uneducated peasants to form cooperatives unless social trust and markets exist; it's also extremely costly to create a unified national mass market and a global market to support the division of labor and mass production; and it is especially costly to create market regulatory institutions to prevent cheating and fraud. These costs prevented the prior formation of industries and, thus, explain the failures of the Qing dynasty and the Republic of China to kick-start China's industrial revolution in the 19th and early part of the 20th centuries, despite their having private-property rights and even democracy.

The poverty of nations is caused by their inability to mass-produce consumption goods. But mass production requires mass markets and mass distribution to render it profitable.

Where does the mass (world) market come from? Early European powers relied on a mercantilist state government and militarized merchants to create monopolistic global markets through colonialism, imperialism and slave trade. In particular, generations of British monarchs and merchants (e.g., the British East India Co.) helped create for England the world's largest textile market, cotton supply chains and trading networks that kick-started the original Industrial Revolution.

Today, developing nations no longer have such "privilege" or the time to nurture such a powerful merchant class to create markets. Hence, governments play a bigger role in market creation.

Therefore, the ongoing industrial revolution in China has been driven not by technology adoption per se, but instead by continuous market creation led by a capable mercantilist government; the market creation is based on mutually beneficial trade instead of the gunboat diplomacy methods of earlier Western powers.[8]

The "Secret" Is Sequencing

Democracy and laissez-faire do not automatically create a global market. Market creation requires state power, correct developmental strategies and correct industrial policies. The "free" market is actually extremely costly to create.[9]

As we've already seen, the development of an industrial market is a sequential process (from the agricultural and artisan stage to the proto-industrial market and so



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on). No matter how late a nation starts its development, it must repeat earlier stages to succeed.[10] It is like learning mathematics. Through thousands of years of development, the human race discovered math knowledge sequentially: from numbers to arithmetic to algebra to calculus, etc. Although calculus is in today's first-year college textbooks, every generation of children must still repeat humanity's evolutionary process to learn math. They do not jump to calculus at age 6; instead they start with learning numbers (with the help of their fingers, just like our ancestors did) and gradually move up the ladder.

In contrast, modern economic theories teach poor countries to leap forward, to start industrialization by building advanced capital-intensive industries (such as chemical, steel and automobile industries), by setting up modern financial systems (such as a floating exchange rate, free international capital flows, and fully fledged privatization of state-owned properties and natural resources) or by erecting modern political institutions (such as democracy and universal suffrage). But such top-down approaches violate the historical sequence of the Industrial Revolution and have led to political chaos, developmental disorders and deformed capitalism in Africa, Latin America, Southeast Asia and the Middle East.

Challenges Ahead

As China has industrialized, it has picked up not only the positives of Western development but the negatives, including rampant corruption and organized crime, unprecedented pollution and environmental destruction, rising divorce and suicide rates, widespread business fraud and scandals, markets full of "lemons" and low-quality goods, pervasive asset bubbles, rising income inequality and class discrimination, frequent industrial accidents, etc. And there are other challenges, including building social safety nets, finishing social and economic reforms in the health care and education sectors, finishing rural urbanization and agricultural modernization, establishing modern financial infrastructure and regulatory institutions as in the U.K. and U.S., and establishing a modern legal system as in Hong Kong and Singapore.

However, as long as China follows the right sequence of economic development, these problems should be merely growing pains and not the same daunting structural obstacles like the Malthusian poverty trap or the middle-income trap faced by many developing nations in Africa, Latin America, the Middle East and Southeast Asia.

Conclusion

Ever since the 15th century, the spirit of capitalism has been "shake hands and do business," regardless of ideology, religion, culture and national boundary. It is precisely such a spirit that has created modern industrial civilization and will continue to change the world.

For a half-century after World War II, the U.S. pursued one of history's most successful nation-building win-win strategies: It nurtured the rebuilding of Europe and Japan and the development of other poor countries and bonded them economically. China today seems to be carrying the U.S. banner forward: China is pursuing win-win development strategies, too, that are focused on economics. It is doing so through global business engagement and international infrastructure buildup regardless of religion, culture, political system and national boundary.

China's rise provides a golden opportunity for developing nations to ride for free on the China train. But how much each individual nation can benefit from China's rise depends entirely on its own worldview, development strategies and industrial policies.

Meanwhile, the 21st century appears to be shaping up as China's century. Ω

Yi Wen, a native of China, is an economist at the Federal Reserve Bank of St. Louis. This article is based on a lecture of his in November (see www.stlouisfed.org/dialogue-with-the-fed/chinas-industrial-revolution-past-present-future), which drew heavily from his forthcoming book, titled The Making of an Economic Superpower: Unlocking China's Secret of Rapid Industrialization. *For the working paper version of the book, see his website at https://research.stlouisfed.org/econ/wen.* *Wen would like to thank William R. Emmons, also an economist at the St. Louis Fed, for comments and Maria A. Arias, a senior research associate at the Bank, for research assistance.*

ENDNOTES

1 See Chang.
2 See Jacques or http://wanderingchina.blogspot.com/2008/08/napoleon-and-his-view-on-china.html.
3 The Malthusian trap, named after the 19th century British political economist Thomas Robert Malthus, suggests that for most of human history, income was largely stagnant because technological advances and discoveries only resulted in more people, rather than improvements in the standard of living. It is argued that many countries in tropical Africa still find themselves in the Malthusian trap.
4 See Acemoglu and Robinson.
5 The specific components of the industrial trinity evolve over time. In terms of energy, it was coal in the 19th century, oil in the 20th century and solar power in the 21st century. In terms of communication, it was the telegraph in the 19th century, the telephone in the 20th century and electronic mail in the 21st century.
6 The demarcations of the stages are approximations and can never be exact, and they often tend to overlap with each other for a substantial period of time. But a higher stage always appears later than a lower stage in history for the successfully industrialized nations, whereas the unsuccessfully industrialized nations tend to directly jump into higher stages by skipping earlier stages.
7 The putting-out system was a system of family-based domestic manufacturing that was prevalent in rural areas of western Europe during the 17th and 18th centuries. Domestic workers involved in this system typically owned their own primitive tools (such as looms and spinning wheels) but depended on merchant capitalists to provide them with the raw materials to fashion products, which were deemed the property of the merchants. Semi-finished products would be passed on by the merchant to another workplace for further processing, while finished products would be taken directly to market by the merchants.
8 In this regard, China contributed to and also benefited from the postwar peaceful world order created by the joint efforts of developing countries, their independence movements and the industrial world powers, especially the United States.
9 See Wen for more detailed analysis.
10 A theoretical framework for why successful industrialization must go through stages is provided in my forthcoming book, titled *The Making of an Economic Superpower: Unlocking China's Secret of Rapid Industrialization.* See https://research.stlouisfed.org/econ/wen/sel.

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